Case V was one of shell explosion, the patient suffering from severe concussion and the right side of the head and body presenting multiple wounds. There was a plug of wax in the right external auditory canal, and after its removal the right drum-head was found to be lusterless, opaque and retracted. The internal changes in this case were found to be comparatively slight, due possibly to the protective effect of the presence of the rumen plug in the external canal. There were small hemorrhages in the tubal part of the tympanic cavity, in the canal of the tensor tympani, in the cranial ends of the fossa subarcuata and perilymphatic aqueduct and in the fundus of the internal meatus. The neuro-epithelium of the labyrinth showed little change, but the detachment of the otolith membrane of the utricle and of the cupulæ of the lateral and superior canals is worth recording. In Case VI the soldier had caught the full blast of a high-explosive shell, which burst close to his left side and shattered this side from head to foot, the force of the explosion, however, having been expended in rupturing the drumhead, the structure of the inner ear together with the nerves in the internal meatus having correspondingly escaped. The only changes of importance found in the 4 cases of explosion injury of the ear were: rupture of the drum-head and hemorrhage into the middle-ear spaces, with hemorrhage in the fundus of the internal meatus in 3 of the 4 cases.

PATHOLOGY AND BACTERIOLOGY

UNDER THE CHARGE OF

OSKAR KLOTZ, M.D., C.M.,

PROFESSOR OF PATHOLOGY AND BACTERIOLOGY, UNIVERSITY OF PITTSBURGH, PITTSBURGH, PA.

Investigation of Strains of Tubercle Bacilli from Animal Tuberculosis.—Griffiths (*Journal of Pathology and Bacteriology*) reports the results of experimental work carried on from 1911 to 1916, in which he examined a number of strains of the tubercle bacilli from naturally acquired tuberculosis in animals. Out of 14 strains derived from 10 monkeys, 50 per cent. yielded tubercle bacilli of bovine type, this proportion being much higher than that reported by other observers who found in 37 naturally tuberculous monkeys only 3 (8.1 per cent.) were infected with bovine tubercle bacilli. That so many naturally tuberculous monkeys should have yielded the bovine type is not surprising when it is remembered that monkeys are as susceptible to bovine as to human tubercle bacilli, and when in captivity are frequently fed on cows' milk. But an interesting fact in the majority of "bovine" cases here reported is that the infection appeared to be of respiratory origin, the intestines and mesenteric glands showing only minor lesions, if any. The other animals examined were one cat, one goat and seven birds. The cat, a domestic pet, was found to be infected with a typically bovine type, infection being by way of the alimentary tract. The goat, purchased for experimental purposes, reacted to the tuberculin test and so was killed and examined. A culture obtained from a lung nodule exhibited the characteristics of the bovine type of tubercle bacillus. This is apparently the only case of natural tuberculosis in the goat in which the type of bacillus has been determined. The seven birds examined comprised a lap-wing, a pigeon, a goshawk, an ibis, a quail, a grackle and a pheasant. All the strains exhibited the characteristic cultural features of the avian type of tubercle bacillus. Griffith included in his report the results of an investigation of the cultural characteristics of a series of strains of bovine tubercle bacilli derived from cows' milk. Twenty-eight strains were examined by him and the findings compared with those of the Royal Commission on Tuberculosis. All possessed the same characteristics, *i. e.*, they varied as to their mode of growth on glycerin media, some being very dysgonic, others relatively eugonic and others displayed intermediate degrees of luxuriance. Another interesting finding incorporated in this report is that of a newly calved heifer, two and one-third years old, vaccinated when four days old with living human tubercle bacilli. Upon examination of the first milk produced a virulent strain of the human type was demonstrated. At autopsy, with the exception of a single minute gray tubercle in the lungs, no sign of tuberculosis was found anywhere in the body. The purpose of this investigation was not so much to show the efficacy of vaccination as to draw immediate attention to the possible danger of using for human consumption the milk of cows which had been vaccinated with living human tubercle bacilli.

The Pathology of Gas Gangrene of Muscle.—EMRYS-ROBERTS and COWELL (*Journal of Pathology and Bacteriology*) recognize three types of gas gangrene clinically: (1) the common type which occurs in the wounded lying out twelve to twenty-four hours or which develops a few hours after the first operation; (2) the fulminating type, in which the patient, if untreated, may be dead in a few hours; (3) the delayed type, with a slow onset so that the condition becomes established several days or even weeks after the date of injury. They emphasize that the formation of gas in the common type is a late phenomenon, that changes in the skin overlying the infected wound precede it; the pallor of the tense skin is followed by a reddish blush, soon becoming a dusky violet, which spreads rapidly from the edge of the wound. Before this the constitutional signs of toxemia are present. The fulminating type of gas infection is favored in gross gunshot injuries of bones, with extensive laceration of muscles, and when the main blood supply to a limb has been completely lost the infection is favored by the presence of the symptom-complex of shock, hemorrhage and exhaustion. From observations on the power of Bacillus aërogenes capsulatus to produce gas in anaërobic media and from their experiments the authors are persuaded that acid is one of the manifestations of its growth in muscle and that acid hematin is responsible for the initial color changes. Gas gangrene is especially liable to occur in deep penetrating wounds and in extensive surface wounds with great laceration of muscle and containing infective material. There is no actual pus on the wound surface, although a sanious, foul-smelling fluid escapes and a thick, turbid